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## STUDIES IN THE GENUS *BIDENS*. I

CONTRIBUTIONS FROM THE HULL BOTANICAL LABORATORY 180

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In the prosecution of taxonomic researches upon the different species of *Bidens*, the writer has found several species either apparently undescribed heretofore or bearing names no longer tenable. This article will deal mainly with some of these cases. A list of the various herbaria and libraries consulted thus far, and of the several botanists who have kindly rendered assistance in this work, will be deferred until a later time.

***Bidens Deamii***, sp. nov.—Herba annua, plus minusve pallida, 3 dm. alta, caule profunde ramoso; ramis subglabris, subtetragonis, striatis, inferioribus arcuato-adscendentibus, ramulis monocephalicis. Folia opposita, petiolata, petiolo adjecto 1–2 cm. longa, tri-(aut pinnati-)partita, subglabra; foliolis terminalibus trilobatis, cuneatis; foliolis lateralibus integris aut dentatis; dentibus et lobis submucronatis, integris. Petioli 3–8 mm. longi, submarginati, hispido-ciliati. Capitula terminalia, longe pedunculata, subcorymbosa, pedunculis adscendentibus aut erectis, 1.5–2 cm. lata, ligulata. Involucrum basi hispidum; squamis duplici serie dispositis; exterioribus linearibus, subviridibus, ciliatis; interioribus paulo longioribus, lanceolatis, margine diaphanis. Ligulae albae aut subroseae, striatae, 8–12 mm. longae. Achaenia linearia, sulcata, spinulosa, biaristata aristis retrorsum hamosis, nigra aut versus apicem fusca, interiora demum plus minusve attenuato-rostrata et 1.2 cm. longa.

*Chas. C. Deam*, Cholula, Mexico, January 1, 1899 (type in Herb. Field Mus.); *Rose, Standley*, and *Russell* 13405, in vicinity of San Blas, Sinaloa, Mexico, March 24, 1910.

A species approaching, in its sometimes slightly beaked achenes, the genus *Cosmos*, but otherwise showing stronger affinities with *Bidens*.

***Bidens parvulifolia***, sp. nov.—Herba caule adscendente aut plus minusve repente, subsimplice, longo 1.5 dm. plusve, subpiloso aut subglabro, tetragono. Folia opposita, petiolata, ovata, acuta

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aut subacuminata, serrata (aut summum jugum trifoliatum lobis serratis), pubescentia, petiolo adjecto 1.5–2.5 cm. longa. Petioli 6–8 mm. longi, ciliati, pilosiusculi. Capitula terminalia, longe pedunculata, 3 cm. lata. Involucrum basi hispidulum, squamis duplici serie dispositis; exterioribus linearibus, glabris; interioribus longioribus, lanceolatis, margine diaphanis. Ligulae flavidae (in specim. exsicc.), striatae, 1.2 cm. longae. Achaenia matura absentia. Ovaria biaristata, aristis retrorsum hamosis.

*Heyde* and *Lux* 6163, Guatemala, 1894 (type in Herb. Univ. Chicago); *eidem* 6162, Fraijanes, Depart. Amatitlan, Guatemala, alt. 900 m., September 1893.

***Bidens ramosissima***, sp. nov.—Herba annua, pallida, ramosissima, 3–5 dm. alta; ramis tenuibus, oppositis, sulcatis, subglabris aut hispidis; ramulis monocephalicis. Folia petiolo adjecto 8–15 mm. longa, tri-(aut pinnati-)partita; foliolis integris aut trilobatis, 1–7 mm. longis, acutis, base angustis aut cuneatis; petiolis 2–4 mm. longis, ciliatis et nonnullis hispidis. Capitula terminalia, subcorymbosa, longe et tenuiter pedunculata, ligulata, 1–2 cm. lata. Involucrum basi hispidum, demum reflexum, squamis duplici serie dispositis; exterioribus linearibus, ciliatis, apice plus minusve dilatatis, mucronatis, 3 mm. longis; interioribus subglabris, lanceolatis, margine diaphanis, 4–5 mm. longis. Ligulae albae aut apice subviolaceae, obovatae, striatae, truncato apice 3–5 dentato dentibus obtusissimis, 6–8 mm. longae. Paleae lineares, 4 mm. longae. Achaenia linearia, sulcata, biaristata, margine et lineis mediis scabrido-hispida, 8–10 mm. longa; aristis retrorsum hamosis.

*W. E. Safford* 1391, near Guadalajara, Jalisco, Mexico, February 23, 1907 (type in U.S. Nat. Herb.).

A species suggestive of *B. Deamii*, but differing in the finally reflexed involucre and the more slender, highly subdivided branches. It is one of the several species of *Bidens* that approach too closely, in color of rays or beaked achenes, the genus *Cosmos*. However, distinctly rostrate achenes are absent in the type, and the involucre, furthermore, is that of a true *Bidens*. On label said to have the common name "accitillo."

***Bidens mexicana***, sp. nov.—Herba caule scandente, ramoso, tereti, striato, glabro. Folia opposita, petiolata, pinnati-(aut bipinnati-)divisa; foliolis aut laciniis submembranaceis, serratis,

glabris aut subciliatis; lateralibus petiolulatis aut subsessilibus, lanceolatis aut ovato-lanceolatis, attenuatis, 2–6 cm. longis; terminale plus minusve petiolulato, lanceolato-attenuato, apice anguste acuminato, basi subcuneato, 4–6 cm. longa. Petioli 1.5–4 cm. longi, glabri, angusti, basi dilatati et connati. Capitula plurima, corymbosa aut paniculato-corymbosa, pedicellata, 6–7 mm. alta, 5–7 mm. lata. Involucrum squamis duplici serie dispositis; exterioribus linearibus, glabris, squarrosis aut reflexis, 3 mm. longis; interioribus lanceolatis, striatis, margine diaphanis, glabris aut apice minute pubescentibus, 4–5 mm. Ligulae flavae, striatae, 8–10 mm. longae. Paleae lineare-lanceolatae, striatae, glabrae aut apice subglabrae, 5 mm. longae. Achaenia nigra, biaristata, margine tuberculato-hispida, 7–9 mm. longa, aristis squarrosis aut recurvis.

*Dr. Edward Palmer* 95, in or near Acapulco, Mexico, October 1894 to March 1895 (type, with the flowering and the fruiting specimen on two separate sheets, in Herb. Univ. Chicago).

An interesting species, allied to *B. reptans* (L.) G. Don and *B. tereticaulis* DC., but apparently related even more closely to *B. Urbanii* Greenman. Various specimens of this number elsewhere in the United States show a considerable range of variation in leaf texture and outline; but the flowering *type* specimen exhibits leaves strikingly close to those of *B. Urbanii* Greenman (see *B. dissecta*, below), of which this species may be the Mexican representative.

***Bidens Brittonii***, sp. nov.—Herba caule scandente, striato, ramis oppositis, 2–4 m. alto. Folia petiolo adjecto 3–9 cm. longa, pinnata; foliolis dentatis incisus aut pinnatisectis, supra pubescentibus, subtus tomentosis, 0.8–2 cm. longis; petiolis et mediis nervis ciliatis. Capitula corymbosa, breviter pedunculata, ligulata. Involucrum 4–6 mm. altum, 5–6 mm. latum, squamis inter se subaequalibus, duplici serie dispositis; exterioribus lineari-spatulatis, ciliatis, nonnullis pubescentibus; interioribus linearibus, apice pubescentibus et angustioribus, margine diaphanis. Ligulae flavae, anguste obovatae, non apice dentatae, 1.5 cm. longae. Paleae lineares, apice pubescentes, 6–8 mm. longae. Achaenia linearia, striata, biaristata, margine tuberculato-hispida.

*C. Wright* 314 *pro parte*, eastern Cuba, 1856–1857 (type in Gray Herb.).

The achene characters are drawn from a fruiting specimen (also collected by WRIGHT, 314) in the Columbia College Herbarium. This specimen, as also

the one at the Gray Herbarium, was mounted upon the same sheet with a specimen of *B. reptans* (L.) G. Don. On the sheet was written, evidently in TORREY's handwriting, "2 species!"; while just below, GRAY had written, "no, A. Gr." In his diagnosis of WRIGHT's plants, GRAY treated this form as a variety of *B. reptans* with dissected leaves. But the fact that the leaves are pubescent above and strongly tomentose beneath, as well as finely dissected, makes it seem certain that two different species have been confused, and that TORREY's assumption was correct. The species is here named in honor of Dr. N. L. BRITTON in grateful recognition of his assistance, upon this and several related species, in supplying data from his widely extended field knowledge of West Indian plants.

***Bidens dissecta***, comb. nov.—*B. reptans* (L.) G. Don, var. *dissectus* O. E. Schulz, Urb. Symb. Antill. 7: 142. 1911.

A Jamaican plant similar to the Porto Rican *B. Urbanii* Greenman, but with more finely divided leaves; also to the Cuban *B. Brittonii*, but with the more finely divided leaves not tomentose beneath. These three species, while perhaps congeners at a remote period in the past, and certainly related to *B. reptans* (L.) G. Don, are, in my opinion, clearly entitled to specific rank and should be classed as separate species. They seem quite distinct from even the most closely approaching forms of the highly variable *B. reptans* (L.) G. Don, many specimens of which I have seen at the New York Botanical Garden, through the courtesy of Dr. BRITTON.

***Bidens anthemoides***, comb. nov.—*Coreopsis anthemoides* DC. Prodr. 5: 573. 1836.

ASA GRAY (Proc. Amer. Acad. 19: 15. 1884) carefully considered this species, but retained it in *Coreopsis*, the taxonomic distinctions between which and *Bidens* he admitted frequently in his writings to be highly artificial. But since the days of DE CANDOLLE and GRAY, botanists have very correctly inclined toward separating these two genera according to the sum total of the characters of each species. In the several transfers consequently made, notably by BRITTON (Bull. Torr. Bot. Club 20: 280-281. 1893), this and the following species seem to have been overlooked. It is interesting to note, however, that C. H. SCHULTZ BIPONTINUS had given, previous to GRAY's observations, the names *Bidens coreopsidioides* (not *B. coreopsidis* as in Gray, loc. cit.) and *Bidens Schaffneri* to specimens of this species sent to the Gray Herbarium.

***Bidens Schaffneri***, comb. nov.—*Coreopsis Schaffneri* A. Gray, Proc. Amer. Acad. 19: 15. 1884.—A perennial species allied with *B. angustissima* H. B. K., *B. procera* Don, and even *B. ludens* Gray.

Evidently placed in *Coreopsis* by GRAY merely because of the practically smooth awns of the achenes. In general habit, also in the shape of the achenes

(which are tetragonal and lack wings), GRAY's type is a true *Bidens*. The associate types collected by PARRY and PALMER (488 and 488½, not "448 and 448½" as erroneously printed in GRAY's original citation), in the Gray Herbarium, match very well SCHAFFNER's no. 202, the type. The name here given for this species should not be confused with the same name given years ago by SCHULTZ BIPONTINUS to *B. anthemoides* on a herbarium label, but never published by him.

BIDENS TENUISSIMA Greene, Leaf. Bot. Crit. 1:200. 1906.—This species, termed *Bidens tenerrima* on the labels of the type collection, was originally described by GREENE as "a gigantic ally of *B. connata* but with almost minute heads." And indeed, when the specimens are compared with the true, ternate-leaved *B. connata* Muhl., the difference in the heads is striking. On carefully comparing them, however, with tall slender forms of *B. discoidea* (T. & G.) Britton, I am unable to find any specific difference. GREENE's type, also the several excellent cotypes in various United States herbaria, should be retained as merely tall, slender forms of *B. discoidea* (T. & G.) Britton.

BIDENS DAHLIOIDES Watson, Proc. Amer. Acad. 26:142. 1891.—At times bearing only erostrate achenes and in this respect simulating *Bidens*, to which genus it had already been referred under different names by earlier writers. But from the involucre, the ligules, and the frequently occurring rostrate achenes, it is seen to be a true species of *Cosmos*. As such it was described long before by OTTO, under the name *Cosmos diversifolius*, and one may well conclude that WATSON merely overlooked OTTO's species by mistake.

BIDENS INCISA (J. B. Ker) G. Don.—*Coreopsis incisa* J. B. Ker, Bot. Reg. 1:7. 1815; *Bidens incisa* G. Don, Sweet Hort. Brit. ed. 3:360. 1839; *Bidens reptans* (L.) G. Don, var. *tomentosus* O. E. Schulz, Urb. Symb. Antill. 7:141. 1911.

KER very justly separated this species from the smooth-stemmed *B. reptans* (L.) G. Don. He laid too much stress, however, upon the "indented ray" of the latter species, this character varying too much to be of certain value. The recently described *B. reptans tomentosa* O. E. S., based on GEO. E. NICHOLS' no. 137, is merely a slightly smaller-leaved form of *B. incisa* (L.) G. Don, the terminal leaflets being less than "about two inches long." A study of several other collectors' specimens, notably at the New York Botanical Garden, some of which Dr. BRITTON had already labeled *Bidens incisa*, showed

that the terminal leaflet varies in length from about 5 cm. to less than 3 cm. Some of the specimens examined were as follows: *J. H. Hart* (without date); *Geo. E. Nichols* 137, particularly the specimen in the Mo. Bot. Gard. Herb.; *E. G. Britton*, N.Y. Bot. Gard. Explor. Jam. 3867; *N. L. Britton*, same series 73.

***Bidens coronata* (L.) Britton**, auctor emend.—*B. coronata* (L.) Fischer, Britton in Bull. Torr. Bot. Club 20:281. 1893.

BRITTON, at the time of transferring several American species from *Coreopsis* to *Bidens*, assumed that this species had already been transferred by FISCHER. In fact, as his citation proves, he rested his assumption entirely upon STEUDEL. But a careful examination of STEUDEL (Nomencl. Bot. ed. 2. 1840), with proper regard for his use of italics for synonyms, shows that FISCHER's plant was *Coreopsis coronata* Hooker (a true *Coreopsis*) and not *Coreopsis coronata* L. STEUDEL even emphasized this fact with the words *nec alior* after *C. coronata* Hooker, to which he referred *Bidens coronata* Fischer. Thus the Linnean species was left in *Coreopsis* until BRITTON's treatment of it as a species of *Bidens*. That the name may be given a definite and technically correct status, it is here set forth as *Bidens coronata* (L.) Britton.

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